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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
NGUYEN, BRIAN D	
ART UNIT	PAPER NUMBER
2661	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/692,554	LEBLANC ET AL.	
	Examiner	Art Unit	
	Brian D. Nguyen	2661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 August 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *See Continuation Sheet* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *See Continuation Sheet* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims pending in the application are 1, 3-15, 17-21, 23, 27-31, 33- 39, 41-44, 46, 48-54, 56-60, 62, 64, 66-70, and 78-88.

Continuation of Disposition of Claims: Claims rejected are 1, 3-15, 17-21, 23, 27-31, 33- 39, 41-44, 46, 48-54, 56-60, 62, 64, 66-70, and 78-88.

DETAILED ACTION

Claim Objections

1. Claims 41-42, 62, 64, and 66-70 are objected to because of the following informalities:

Claims 41-42, line 1, it is suggested to insert: --tone-- before "detection".

Claim 62, line 3, it is suggested to delete: "further comprising".

Claim 64, line 4, it is suggested to delete: "comprising a plurality of voice frames".

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1, 3-15, 17-21, 23, 27-31, 33-39, 41-44, 46, 48-54, 56-60, 62, 64, 66-70, and 78-88, are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Page 62, lines 30-31 of the specification describes "delays DTMF detection until the last frame of speech is processed before a full packet is constructed." Not "the tone detection is delayed until the last frame of the voice packet is received." as claimed in the independent claims.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 5-6, 39, 41-44, 48-51, 64, 66-70, and 85-86 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites the limitation "the separated component" in line 7. There is insufficient antecedent basis for this limitation in the claim.

Claim 39 recites the limitation "the dual tones" in lines 17 and 21. There is insufficient antecedent basis for this limitation in the claim.

Claim 48 recites the limitation "the second portion" and “the separated component” in line 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 49 recites the limitation "the first portion" and “the second portion” in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 50 recites the limitation "the separated component" in line 7. There is insufficient antecedent basis for this limitation in the claim.

Claim 64 recites the limitation "the separated” in line 9. There is insufficient antecedent basis for this limitation in the claim.

Claim 66 recites the limitation "the separated component” in lines 2 and 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 68 recites the limitation "the separated component” in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 85 recites the limitation "the separated first signal” in line 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 86 recites the limitation "the composite signal" in line 6. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1, 3, 5, 8, 9, 11, 14, 17, 27, 31, 35, 46, 48, 50, 53, 56, 64, 66, 70, 78, 79, 81-83, 87, and 88, 4, 6, 10, 12, 21, 28, 49, 51, 60, 67, 80, and 84 are rejected under 35 U.S.C. 103(a) as being obvious over Mark (5,949,874) in view of Li (6,549,587).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the

reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Regarding claims 1, 46, and 64, Mark (874) discloses "a computer-readable media embodying a program executable by a computer (col. 8, lines 33-39)" including "a data transmission system, comprising: a telephony device having a composite signal output comprising a plurality of components (figure 4A, element 4 has a composite signal output as that of figure 4B); and a signal processing system coupled to the telephony device (figure 4A, element 8), the signal processing system comprising a detector to separate one of the components from the composite signal (figure 4A, element 515 and 518), sample a portion of the separated component (col. 16, lines 4446 where it is inherent that converting the analog tones to digital data comprises sampling the analog tone to obtain sample points used in further digital processing), and detect from the sampled portion of the separated component whether the separated component comprises a tone (col. 17, lines 32-41). Mark (874) does not disclose delaying the tone detection until the last frame of the voice packet is received. However, Li discloses this limitation (see col. 36, lines 21-24). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to delay the detection as taught by Li in the system of Mark (874) in order to prevent leakage through the audio channel.

Regarding claim 8, Mark (874) discloses "a method of dual tone signal detection in a composite signal having first and second components (figure 4B where the signal 600 has a plurality of different components where the DTMF signal has a dual tone structure comprising high and low frequencies), comprising: separating the composite signal into its first and second components (figure 4B, where each component is handled separately, for example component

604 is used to handle the convey the destination of the signal this can be further read in col. 17, lines 3-23); detecting from a portion of the first component whether the first component comprises a first one of the dual tones (col. 10, lines 12-30 describes that the dtmf signal component of figure 4B where a first tone of the component is further detected as read in col. 11, lines 14-28); and detecting from a portion of the second component whether the second component comprises a second one of the dual tones (col. 10, lines 12-30 describes that the dtmf signal component of figure 4B where a second tone of the component is further detected as read in col. 11, lines 14-28).". Mark (874) does not disclose delaying the tone detection until the last frame of the voice packet is received. However, Li discloses this limitation (see col. 36, lines 21-24). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to delay the detection as taught by Li in the system of Mark (874) in order to prevent leakage through the audio channel.

Regarding claim 81, Mark ('874) discloses "a system for detecting a tone in a composite signal having a plurality of components (figure 4B where the signal 600 has a plurality of different components) comprising: a filter to separate one of the components from the composite signal (figure 4A, element 515 is used to demodulate the tones as described in col. 17, lines 32-36, it is further noted that demodulation inherently contains filtering to separate unwanted elements such as noise from the signal data, therefore the demodulator has the function of a filter); a sampler to sample a portion of the separated component (co/. 16, lines 44-46 where it is inherent that converting the analog tones to digital data comprises sampling the analog tone to obtain sample points used in further digital processing); and a detector to detect from a portion of the separated component whether the separated component comprises the tone (figure 4A,

element 515 and 518 as read in col. 17, lines 32-41).". Mark (874) does not disclose delaying the tone detection until the last frame of the voice packet is received. However, Li discloses this limitation (see col. 36, lines 21-24). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to delay the detection as taught by Li in the system of Mark (874) in order to prevent leakage through the audio channel.

Regarding claims 14, 31, and 53, Mark ('874) discloses a computer-readable media embodying a program executable by a computer (co/. 8, lines 33-39)" including "a system for detecting a tone in a composite signal having first and second components (figure 4B where the signal 600 has a plurality of different components where the DTMF signal has a dual tone structure comprising high and low frequencies), comprising: means for separating the composite signal into its first and second components (figure 2B, element 302 is shown separating the signal into two components); means for determining a frequency for each of the separated first and second components (figure 2B, elements 308 and 310; the description of elements 308 and 310 is read in col. 11, lines 14-28); and means for detecting as a function of the determined frequency for each of the first and second components whether either of the first and second components comprises the tone (figure 2B, element 312; the description of element 312 is read in col. 11, lines 29-42).". Mark (874) does not disclose delaying the tone detection until the last frame of the voice packet is received. However, Li discloses this limitation (see col. 36, lines 21-24). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to delay the detection as taught by Li in the system of Mark (874) in order to prevent leakage through the audio channel.

Regarding claims 17, 35, and 56 Mark (`874) discloses, "separating means comprises a first bandpass filter to pass the first component and a second bandpass filter to pass the second component (figure 2B, element 304; col. 10, lines 12-21) and a second bandpass filter to pass the second component (figure 2B, element 306; col. 10, lines 12-21)."

Regarding claims 3, 9, 27, 48, and 66, Mark (`874) further discloses, "the separated component comprises first and second portions, and the signal processing system further comprising a state machine to invoke the detector to detect the tone in the second portion of the separated component (figure 2B, element 104 acts as a state machine by controlling the tone detector in response to signals that indicate a change in state, this can be read in col. 9, lines 34-44 and 54-58)."

Regarding claims 5, 11, and 50, Mark ('874) further discloses, "formatting the first component into first and second frames, the first frame preceding the second frame in time (figure 3A, which represents a part of the DTMF signal of figure 4B and where each component has been formatted into at least two frames separated in time, for example frames 500 and 502), each of the first and second frames having first and second portions (figure 3A, each frame 500 and 502 has at least two portions, elements 501 and 503), and wherein the detection of the first one of the dual tones comprises detecting from the second portion of the first and second frames whether the first component comprises the first one of the dual tones (co/. 11, lines 14-28 describes the detecting the tone in the corresponding portion, each low and high frequency tone is detected separately and thus the tone is determined to be a valid tone from the corresponding second portion)."

Regarding claims 78, 82, and 87, Mark ('874) further discloses, "means for estimating a characteristic of each of the first and second components, the detection means detecting whether either of the first and second components comprises the tone further as a function of the estimated characteristic for each of the first and second . components (figure 3A, where the amplitude or energy of each portion is a unique characteristic to that portion and helps to define that portion, this is carried out by element 302 of figure 2B and a further description of amplification can be found in col. 13, lines 18-35)."

Regarding claims 79, 83, and 88, Mark ('874) further discloses, "the characteristic comprises power (figure 3A and col. 13, lines 18-35 where amplitude or energy is the power of the portion)."

Regarding claim 70, Mark ('874) further discloses, "wherein the telephony device comprises a telephone (figure 4A, element 4)."

Claim Rejections - 35 USC § 103

Regarding claims 4, 6, 10, 12, 28, 49, 51, and 67, Mark ('874) lacks "wherein the first portion precedes the second portion in time for each of the first and second frames." Although Mark ('874) does not explicitly disclose that the first portion precedes the second portion in time, it would have been obvious to one of ordinary skill in the art to do this as a matter of design choice. The motivation being that, for example, the first position preceding the second portion in time holds no advantage over the second portion preceding the first portion in time or even over both portions occurring at the same time as in Mark ('874) (figure 3A), it is merely a matter of designer preference.

Regarding claims 21, 60, 80, and 84, Mark ('874) explicitly lacks "comparing a ratio of the power estimation for the first and second components to a threshold." Although Mark ('874) does not explicitly disclose the "ratio", he does disclose that the difference between the first and second components, or the twist, is compared against a threshold (col. 13, lines 56-67). It would have been obvious to one with ordinary skill in the art at the time of invention to have the ratio of the power estimates compared against a threshold instead of the difference as a matter of design choice. The reason is because the object of comparing the two components power estimates is to determine if they fall within an acceptable range. Whether this is done using ratios or differences is up to the designer, the same result of identifying where the components lie relative to a threshold is achieved. The motivation for wanting to know how the components compare to a threshold is so that negative effects of too much "twist" can be avoided (col. 11, lines 9-7).

8. Claims 7, 13, 29, 30, 52, 68, and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mark (874) in view of Li as applied to claims 1, 8, 46, 64, and 81 above, and further in view of Bremer (5,311,578).

Regarding claims 7, 13, 29, 52, and 68, Mark ('874) further discloses "formatting the first component into first and second frames, the first frame preceding the second frame in time (figure 3A, which represents a part of the DTMF signal of figure 4H and where each component has been formatted into at least two frames separated in time, for example frames 500 and 502), each of the first and second frames having first and second portions, the first portion of the frame precedes the second portion of the [frame] in time for each of the first and second frame (figure 3A, each frame 500 and 502 has at least two portions separated in time from one another, elements 501 and 503)." However, Mark ('874) lacks what Bremer discloses

"bypassing the detection step of the first one of the dual tones for the first portion of the second frame if the detection step for the first one of the dual tones does not detect the first one of the dual tones in the second portion of the first frame (figure 4, steps 510 and 525 where in step 510 there is no tone detected, thus it skips all other portions looking for tones and goes to step 525)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the bypassing of the portion for the purpose of continuing on with processing of information. The motivation for continuing on with the processing of information is so that resources are not wasted (Bremer, col. 6, lines 45-47 the not wasting resources is implied by the fact that there is a time limit associated with the detection of a tone).

Regarding claims 30 and 69, Mark ('874) and Bremer lack "wherein the first portion precedes the second portion in time for each of the first and second frames." Although Mark ('874) and Bremer do not explicitly disclose that the first portion

precedes the second portion in time, it would have been obvious to one of ordinary skill in the art to do this as a matter of design choice. The motivation being that, for example, the first position preceding the second portion in time holds no advantage over the second portion preceding the first portion in time or even over both portions occurring at the same time as in Mark ('874) (figure 3A), it is merely a matter of designer preference.

9. Claims 15, 23, 33, 38, 39, 41, 54, 62, 85, and 86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mark (874) in view of Li as applied to claims 14, 31, 39, 46, and 53 above, and further in view of Mark (5,583,933).

Regarding claim 39, Mark ('874) discloses "a system for transmitting a dual tone, comprising: a telephony device having a composite signal output comprising first and second

components (figure 2B, element 120 has a composite signal output as that of figure 4B); and a signal processing system coupled to the telephony device (figure 2B, element 192), the signal processing system comprising, a first bandpass filter to separate the first component from the composite signal (figure 28, element 304), a second bandpass filter to separate the second component from the composite signal (figure 2B, element 306), a first power estimator to estimate power of the separated first component (figure 3A, where the amplitude or energy of each portion is a unique characteristic to that portion and helps to define that portion, this is carried out by element 302 of figure 2B and a further description of amplification can be found in col. 13, lines 18-35), a second power estimator to estimate power of the separated second component (figure 3A and col. 13, lines 18-35, where the amplitude or energy of each portion is a unique characteristic to that portion and helps to define that portion; it should be noted that although there aren't two distinct power estimators, it would have been obvious to have two as a. matter of design choice), a first detector to determine frequency of the separated first component (figure 2B, element 308), a second detector to determine frequency component (figure 2B, element 310).". However, Mark ('874) lacks what Mark ('933) discloses, "a first comparator to compare the determined frequency of the first component respectively to a power threshold and frequency range to determine whether the first component comprises one of the dual tones (col. 16, lines 65-col. 17, lines 1-16 where the tables of figures 8B-8E show the acceptable and rejectable ranges for frequencies and although it is not explicitly stated that there is a first comparator to determine what tone is detected, it is strongly implied by the tables there must be one), and a second comparator to compare the estimated power and determined frequency of the second component respectively . to a power threshold and frequency range to determine whether

the second component comprises the other one of the dual tones (col. 16, lines 65-col. 17, lines 1-16 where the tables of figures 8B-8E show the acceptable and rejectable ranges for frequencies and although it is not explicitly stated that there is a second comparator to determine what tone is detected, it is strongly implied by the tables there must be one)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the comparators for the purpose of determining if the detected frequencies are indeed within a range of acceptable frequencies. The motivation for determining whether or not the detected frequency is within an acceptable range is so that a tone is not detected in error

Regarding claims 15, 38, and 54, Mark ('874) lacks what Mark (`933) discloses, "comparing the determined frequency of each of the separated first and second components to a plurality of frequency ranges to determine whether either of the first and second components comprises the tone (figure 8B shows a table of acceptable frequency ranges for detecting and determining which frequency has been received; a more detailed description can be read in col. 16, lines 65-col. 17, lines 1-16)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the frequency ranges for the purpose of rejecting tones that are outside the acceptable range. The motivation for doing this is so that there is minimal error in detecting tones properly.

Regarding claim 85, .Mark ('874) further discloses, "a first power estimator to the estimate power of the separated first component (figure 3A, where the amplitude or energy of each portion is a unique characteristic to that portion and helps to define that portion, this is carried out by element 302 of figure 2B and a further description of amplification can be found in col. 13, lines 18-35)". However, Mark ('874) lacks what Mark ('933) further discloses, "the

first comparator further comparing the estimated power of the separated first component to a power threshold, the determination of whether the separated first signal comprises said one of the tones being further a function of the comparison (col. 16, lines 65-col. 17, lines 1-16 where the tables of figures 8B-8E show the acceptable and rejectable ranges for frequencies and although it is not explicitly stated that there is a first comparator to determine what tone is detected, it is strongly implied by the tables there must be one)." It would have been obvious to one with ordinary skill in the art to include the further function of the first comparator for the same reasons and motivation as in claim 39.

Regarding claim 86, Mark ('933) lacks what Mark ('874) further discloses "first... power estimators each estimating power of a respective one of the first and second separated components (figure 3A, where the amplitude or energy of each portion is a unique characteristic to that portion and helps to define that portion, this is carried out by element 302 of figure 28 and a further description of amplification can be found in col. 13, lines 16-35)..." Mark ('874) however, does not explicitly disclose a "second power estimator" and "a twist estimator to compare a ratio of the estimated power for the first and second components, the determination of whether the composite signal comprises the dual tone being further a function of the comparison.". Although Mark ('874) does not disclose the "second power estimator" he does disclose a first power estimator, and since they perform the same function it would have been obvious to include another power estimator as a matter of design choice. As seen in figure 2B of Mark ('874) there are two components separated where the power has been estimated previously by element 302. It would have been obvious to one with ordinary skill in the art at the time of invention to split the incoming signal before estimating the power, thus requiring two power

estimators, as a matter of design choice. Further, Mark ('874) does not explicitly disclose the "twist... ratio", he does disclose that the difference between the first and second components as the twist and this is compared against a threshold (col. 13, lines 56-67). It would have been obvious to one with ordinary skill in the art at the time of invention to have the ratio of the power estimates compared against a threshold instead of the difference as a matter of design choice. The reason is because the object of comparing the two components power estimates is to determine if they fall within an acceptable range. Whether this is done using ratios or differences is up to the designer, the same result of identifying where the components lie relative to a threshold is achieved. The motivation for wanting to know how the components compare to a threshold is so that negative effects of too much "twist" can be avoided (Mark (`874), col. 11, lines 1-7).

Regarding claims 23, 33, 41, and 62, Mark ('874) lacks what Mark ('933) further discloses, "a frequency calculator (figure 8B, where the frequency ranges are determined to be acceptable within the detector as shown) that estimates a mean deviation to one of a plurality of frequencies for each of the separated first and second components and compares the estimated mean for each of the separated first and second components to a respective threshold (col. 16, lines 65-col. 17, lines 1-16 and figure 8B shows a table of acceptable frequency ranges frequency ranges for detecting and determining which frequency has been received, and although the ranges or acceptability are not labeled as a "mean deviation" they can be considered as such because they represent a tolerance (deviation) surrounding a nominal (mean) frequency, thus, just as with a "mean deviation"; the nominal tolerance functions to accept detected frequencies within a given range).". It would have been obvious to one with ordinary skill in the art at the

time of invention to include the frequency ranges as a "mean deviation" for the purpose of rejecting tones that are outside the acceptable range. The motivation for doing this is so that there is minimal error in detecting tones properly.

10. Claims 19, 20, 34, 36, 58, and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mark (874) in view of Li as applied to claims 14, 31, and 53 above, and further in view of McCarthy (5,333,191).

Regarding claims 20, 34, and 59 Mark ('874) lacks what McCarthy discloses, "means for converting the first and second components to complex signals prior to the frequency determination (figure 1, elements 202-210 in conjunction with one another take the received signal from element 102 and convert it into a complex signal before detecting the tones in element 300, the process for this can be read in col. 3, lines 54col. 8, lines 1-31 with particular emphasis on col. 8, lines 1-39 where it shows the signal in its complex form (equation 15) and how 'the tones are detected from that). It would have been obvious to one with ordinary skill in the art at the time of invention to have the signal converted to its complex form before detecting the tones for the purpose of being able to detect the tones. The motivation for converting to a complex signal to detect the tones is one of feasibility, it is much easier to detect frequency tones in a signal by first converting it to a complex signal than it is to detect the tones from the straight received signal.

Regarding claims 19, 36, and 58, Mark (`874) lacks what McCarthy discloses, the bandpass filtering of Mark ('874) comprises "complex filtering (figure 1, elements 202210 in conjunction with one another take the received signal from element 102 and convert it into a complex signal before detecting the tones in element 300, the process for this can be read in col.

3, lines 54-col. 8, lines 1-31 with particular emphasis on col. 8, lines 1-31 where it shows the signal in its complex form (equation 15) and how the tones are detected from that, thus the signals are complex so is the filtering)." It would have been obvious to one with ordinary skill in the art at the time of invention to have the complex filtering for the purpose of being able to detect the tones. The motivation for complex signal filtering to detect the tones is one of feasibility, it is much easier to detect frequency tones in a signal by first converting it to a complex signal than it is to detect the tones from the straight received signal.

11. Claims 18, 37, and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mark (874) in view of Li as applied to claims 14, 31, and 53 above, and further in view of Tsai (6,393,124).

Regarding claims 18, 37, and 57, Mark ('874) lacks what Tsai discloses "means for down sampling the separated first and second components prior to the frequency determination (figure 2, element 26 as seen comes before the detection logic 36, i.e. frequency determination)." It would have been obvious to one with ordinary skill in the art at the time of invention to include the down sampling for the purpose of reducing the number of samples in the signal. The motivation for reducing the number of samples in the signal is to reduce the computational load on later processing (Tsai, col. 4, lines 1826).

12. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mark (874) in view of Li and Mark (933) as applied to claims 39 and 71 above, and further in view of Tsai (6,393,124).

Regarding claim 44, Mark ('874) and Mark ('933) lack what Tsai discloses, "a first down sampler to down sample the separated first component prior to the first power estimation and

frequency determination (figure 2, element 26 as seen comes before the detection logic 36, i.e. frequency determination)..." Tsai however, does not explicitly disclose "a second down sampler to down sample the separated second component prior to the frequency determination by the second detector.". Although Tsai does not disclose the "second down sampler" he does disclose a first down sampler, and since they perform the same function it would have been obvious to include another down sampler as a matter of design choice. As seen in figure 2 of Tsai there are two components that have been separated where the down sampling has taken place. It would have been obvious to one with ordinary skill in the art at the time of invention to split the incoming signal before down sampling, thus requiring two down sampler, as a matter of design choice. It would have been obvious to one with ordinary skill in the art at the time of invention to include the down sampling for the purpose of reducing the number of samples in the signal. The motivation for reducing the number of samples in the signal is to reduce the computational load on later processing (Tsai, col. 4, lines 18-26).

13. Claims 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mark (874) in view of Li and Mark (933) as applied to claims 39 and 71 above, and further in view of McCarthy.

Regarding claim 42, Mark ('874) and Mark ('933) lack what McCarthy discloses, "a first summer to convert the separated first component to a first complex signal prior to the first power estimation and frequency determination (figure 1, elements 202-210 in conjunction with one another take the received signal from element 902 and convert it into a complex signal before detecting the tones in element 300, the process for this can be read in col. 3, lines 54-col. 8, lines 1-3J with particular emphasis on col. 8, lines 1-39 where it shows the signal in its complex form

(equation 15) and how the tones are detected from that), and a second summer to convert the separated second component to a second complex signal prior to the second power estimation and frequency determination (although McCarthy does not disclose a second "summer" to convert the signal to its complex form, he does disclose the first "summer; therefore it would have been obvious to one with ordinary skill in the art at the time of invention to include the second summer if there had been two components because each component would need to be converted and as a matter of design choice, two "summers" would be faster than one)."
It would have been obvious to one with ordinary skill in the art at the time of invention to have the signal converted to its complex form before detecting the tones for the purpose of being able to detect the tones. The motivation for converting to a complex signal to detect the tones is one of feasibility, it is much easier to detect frequency tones in a signal by first converting it to a complex signal than it is to detect the tones from the straight received signal.

Regarding claim 43, Mark (`874) and Mark (`933) lack what McCarthy discloses, the bandpass filtering of Mark (`874) and Mark (`933) comprises "complex filtering (figure 1, elements 202-210 in conjunction with one another take the received signal from element 102 and convert it into a complex signal before detecting the tones in element 300, the process for this can be read in col. 3, lines 54-col. 8, lines 1-31 with particular emphasis on col. 8, lines 1-31 where it shows the signal in its complex form (equation 15) and how the tones are detected from that, thus the signals are complex so is the filtering)," It would have been obvious to one with ordinary skill in the art at the time of invention to have the complex filtering for the purpose of being able to detect the tones. The motivation for complex signal filtering to detect the tones is

one of feasibility, it is much easier to detect frequency tones in a signal by first converting it to a complex signal than it is to detect the tones from the straight received signal.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian D. Nguyen whose telephone number is (571) 272-3084. The examiner can normally be reached on 7:30-6:00 Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on (571) 272-3126. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

11/7/05

BRIAN NGUYEN
PRIMARY EXAMINER